



HAMATEUR CHATTER



The Milwaukee Radio Amateurs Club

December 2013 Volume 21, Issue 12

One of the World's Oldest Continuously Active Radio Amateur Clubs—since 1917

Swapfest—January 4, 2014

Just 3 days after New Year's!

The West Allis Radio Amateur Club's 42nd Annual Midwinter Swapfest will be held on Saturday, January 4, 2014, 8:00AM to 1:00PM at the Waukesha County Expo Center Forum, Waukesha, WI.

Directions: I-94 west from Milwaukee to County Hwy J (exit 294), south to County Hwy FT, west to the Expo.

Testing: will be held 9:00-11:15AM at AMF Waukesha Lanes (across the road from Expo).

Advance admission: \$4.00
Admission at the door: \$5.00
Tables (8 Ft): \$24

Send advance registration form and #10 business size SASE to WARAC Swapfest, PO Box 1072, Milwaukee, WI 53201. Advance reservation deadline is December 25, 2013.

For more information visit <http://www.warac.org/swap/index.htm> or call Phil Gural, W9NAW, 414.425.3649.

- West Allis Radio Amateur Club,
Inc. www.warac.org



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The Club Phone Number is: (414) 332-MRAC or

(414) 332- 6 7 2 2

Visit our website at:

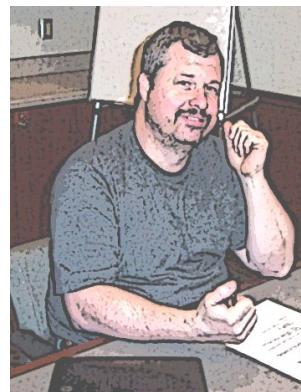
www.w9rh.org

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Temperature and Voltage Variation of Ceramic Capacitors, or Why Your 4.7 μ F Capacitor Becomes a 0.33 μ F Capacitor

Abstract: The reality of modern, small form-factor ceramic capacitors is a good reminder to always read the data sheet. This tutorial explains how ceramic capacitor type designations, such as X7R and Y5V, imply nothing about voltage coefficients. Engineers must check the data to know, really know, how a specific capacitor will perform under voltage.

A similar version of this article appeared on [EDN](#), November 26, 2012.

Introduction: I Was Surprised

A few years ago, after more than 25 years of working with these things, I learned something new about ceramic capacitors. I was working on an [LED](#) light-bulb driver and the time constant of an RC circuit in my project simply did not seem to be right.

I immediately assumed that there was an incorrect component value installed on the board, so I measured the two resistors making up a voltage-divider. They were just fine. I desoldered the capacitor from the board and measured it. It, too, was fine. Just to be sure, I got new resistors and capacitor, then measured and installed them. I fired up the circuit, checked that the basic operation was proper, and went to see if my RC time-constant problem was resolved. It was not.

I was testing the circuit in its natural environment: in its housing, which itself was in an enclosure to mimic a "can" for ceiling lighting. The component temperatures in some instances reached well over +100°C. Even in the short time that it took me to get around to retesting the RC behavior, things could get quite hot. My next conclusion, of course, was that the temperature variation of the capacitor was the issue.

I was skeptical about this conclusion as I was using X7R capacitors which, as I had known for many years, only varied $\pm 15\%$ up to +125°C. To be sure and to confirm my memory, I reviewed the data sheet for the capacitor that I was using. That is when my ceramic capacitor reeducation began.

Background on Some Basic Ceramic Capacitors Types

For those who don't have this stuff memorized (like virtually everyone), **Table 1** shows the letters and numbers used for ceramic capacitor types and what each means. This table describes Class II and Class III ceramics. Without getting too deep into details, Class I capacitors include the common [COG](#) (NPO) type. These are not as volumetrically efficient as the ones in our table, but they are far more stable with environmental conditions and they do not exhibit piezo effects. The ones in the table below, however, can have widely varying characteristics; they will expand and contract with applied voltage, sometimes causing audible buzzing or ringing, piezo effects.

Table 1. Types of Ceramic Capacitors

1st Character: Low Temp		2nd Character: High Temp		3rd Character: Change over Temp (max)	
Char	Temp (°C)	Num	Temp (°C)	Char	Change (%)
Z	+10	2	+45	A	± 1.0
Y	-30	4	+65	B	± 1.5
X	-55	5	+85	C	± 2.2
-	-	6	+105	D	± 3.3
-	-	7	+125	E	± 4.7
-	-	8	+150	F	± 7.5
-	-	9	+200	P	± 10
-	-	-	-	R	± 15
-	-	-	-	S	± 22
-	-	-	-	T	+22, -33
-	-	-	-	U	+22, -56
-	-	-	-	V	+22, -82

Of the many capacitor types above, the most common in my experience are X5R, X7R, and Y5V. I never use the Y5Vs because of their extremely large [capacitance](#) variation over environmental conditions.

When capacitor companies develop products, they choose materials with characteristics that will enable the capacitors to operate within the specified variation (3rd character) over the specified temperature range (1st and 2nd character). The X7R capacitors that I was using should not vary more than $\pm 15\%$ over a temperature range of -55°C to +125°C. OK, so either I had a bad batch of capacitors or something else was happening in my circuit.

Not All X7Rs Are Created Equal

Since my RC time-constant problem was far greater than would be explained by the specified temperature variation, I had to dig deeper. Looking at the data for capacitance variation versus applied voltage for my capacitor, I was surprised to see how much the capacitance changed with the conditions that I set. I had chosen a 16V capacitor to operate with a 12V bias. The data sheet indicated that my 4.7 μ F capacitor would typically provide 1.5 μ F of capacitance under these conditions! Now *this* explains the problem that my RC circuit was having. The data sheet then showed that if I just increased the size of my capacitor from 0805 to 1206, the typical capacitance under these conditions would be 3.4 μ F. This called for more investigation.

I found that the Murata and TDK® websites have nifty tools that allow one to plot the variations of capacitors over different environmental conditions. I investigated 4.7 μ F capacitors of various sizes and voltage ratings. **Figure 1** graphs the data that I extracted from the Murata tool for several different 4.7 μ F ceramic capacitors. I looked at both X5R and X7R types in package sizes from 0603 to 1812 and with voltage ratings from 6.3V_{DC} to 25V_{DC}.

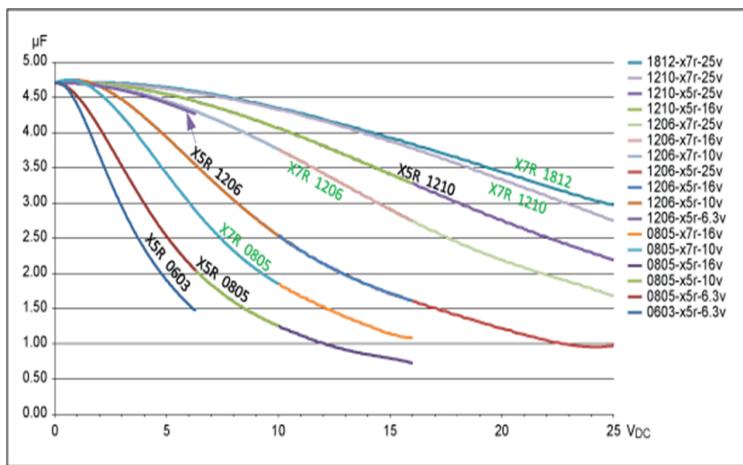


Figure 1. Temperature variation vs. DC voltage for select 4.7µF capacitors.

Note, first, that as the package size increases, the capacitance variation with applied DC voltage decreases, and substantially.

A second interesting point is that, within a package size and ceramic type, the voltage rating of the capacitors seems often to have no effect. I would have expected that using a 25V-rated capacitor at 12V would have less variation than a 16V-rated capacitor under the same bias. Looking at the traces for X5Rs in the 1206 package, we see that the 6.3V-rated part does indeed perform better than its siblings with higher voltage ratings. If we had looked over a broader range of capacitors, we would have found this behavior to be common. The sample set of capacitors that I was considering do not exhibit this behavior as much as the general population of ceramic capacitors.

A third observation is that, for the same package, the X7Rs always have better temperature sensitivity than X5Rs. I do not know if this holds true universally, but it did seem so in my investigation.

Using the data from this graph, **Table 2** shows how much the X7R capacitances decreased with a 12V bias.

Table 2.
X7R Capacitors with a
12V Bias

Siz e	C	No m.	%
0801.5	32.		
5	3	6	
1203.4	73.		
6	3	0	
1214.1	88.		
0	6	5	
1814.1	88.		
2	8	9	
No			
min4.7	100		
al			

We see a steady improvement as we progress to larger capacitor sizes, until we reach the 1210 size. Going beyond that size yields no improvement.

Choosing the Right Capacitor

I really did not want to go to a 1210 package. Fortunately, I had the freedom to increase the values of the resistors involved by about 5x and, thus, decrease the capacitance to 1.0µF. **Figure 2** graphs the voltage behavior of several 16V, 1.0µF X7R caps versus their 4.7µF, 16V, X7R cousins.

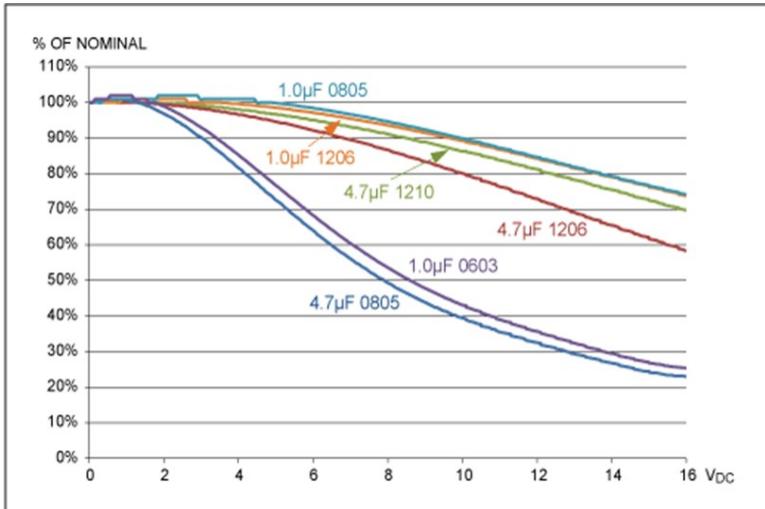


Figure 2. Performance of 1.0µF vs. 4.7µF capacitors.

The 0603 1.0µF capacitor behaves about the same as the 0805 4.7µF device. Both the 0805 and 1206 1.0µF capacitors perform slightly better than the 1210 4.7µF size. By using the 0805 1.0µF device, I was thus able to keep the capacitor size unchanged while getting a capacitor that only dropped to about 85% of nominal and not to about 30% of nominal under bias.

But there was more to be learned. I was still confused. I had been under the impression that all X7R caps *should* have similar voltage coefficients since the dielectric used was the same, namely X7R. I contacted a colleague and expert on ceramic capacitors.¹ He explained that there are many materials that qualify as "X7R." In fact, any material that allows a device to meet or exceed the X7R temperature characteristics, ±15% over a temperature range of -55°C to +125°C, can be called X7R. He also explained that there are no voltage coefficient specifications for X7R or any other types. This is a very important point, so I will repeat it. A vendor can call a capacitor X7R (or X5R or any other type) as long as it meets the temperature coefficient specs, regardless of how bad the voltage coefficient is.

As an applications engineer, this fact simply reinforces the old maxim (pun intended) that any experienced apps engineer knows: "Read the data sheet!"

As the capacitor vendors have made smaller and smaller components, they have had to compromise on the materials used. To get the needed volumetric efficiencies in the smaller sizes, they have had to accept worse voltage coefficients. Of course, the more reputable manufacturers do their best to minimize the adverse affects of this trade-off. . Consequently, when using ceramic capacitors in small packages, or indeed any components, it is extremely important to read the data sheet. Regrettably, often the commonly available data

sheets are abbreviated and will have very little of this kind of information, so you may have to request more detailed information from the manufacturer.

What about those Y5Vs that I summarily rejected? For kicks, let's examine a common Y5V capacitor. I will not identify the vendor of this part, as it is no worse than any other vendor's Y5V. I chose a 4.7 μ F capacitor rated at 6.3V in an 0603 package and looked at the specs at 5V and +85°C. At 5V the typical capacitance is 92.9% below nominal, or 0.33 μ F. That's right. Biasing this 6.3V-rated capacitor with 5 volts will result in a capacitance that is 14 times smaller than nominal. At +85°C with 0V bias the capacitance decreases by 68.14%, from 4.7 μ F to 1.5 μ F. Now you might expect this to reduce the capacitance under 5V bias from 0.33 μ F to 0.11 μ F. Fortunately, these two effects do not combine in this way. In this particular case the change in capacitance with 5V bias is worse at room temperature than at +85°C. To be clear, with this part under 0V bias we see the capacitance drop from 4.7 μ F at room temperature to 1.5 μ F at +85°C, while under 5V bias the capacitance increases with temperature from 0.33 μ F at room temperature to 0.39 μ F at +85°C. This should convince you that you really need to check component specifications carefully.

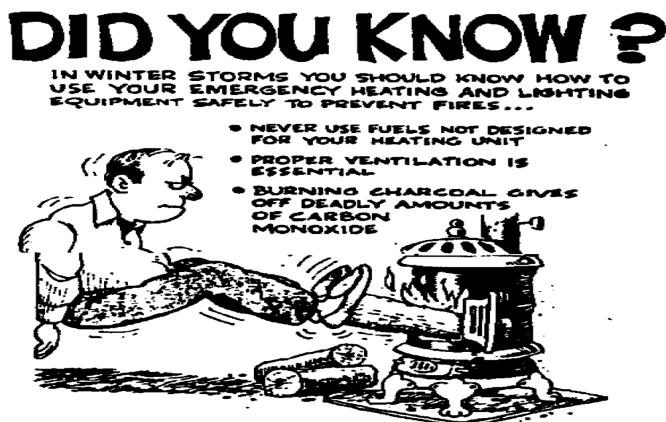
Conclusion

As a result of this lesson, I no longer just specify an X7R or X5R capacitor to colleagues or customers. Instead, I specify specific parts from specific vendors whose data I have checked. I also warn customers to check data when considering alternative vendors in production to ensure that they do not run into these problems.

The larger lesson here, as you may have surmised, is "read the data sheet," every time, no exceptions. Ask for detailed data when the data sheet does not contain sufficient information. Remember too that the ceramic capacitor type designations, such as X7R, X5R, and Y5V, imply nothing about voltage coefficients. Engineers must check the data to know, really know, how a specific capacitor will perform under voltage.

Finally, keep in mind that, as we continue to drive madly to smaller and smaller sizes, this is becoming more of an issue every day.

Reference The author wishes to thank Chris Burkett, FAE at TDK, for his explanations of "what the heck was going on here?"



Weather Hazard Awareness

Winter's Impact

Storms with Strong Winds

Sometimes winter storms are accompanied by strong winds creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chill. Strong winds with these intense storms and cold fronts can knock down trees, utility poles, and power lines. Storms near the coast can cause coastal flooding and beach erosion as well as sink ships at sea. In the West and Alaska, winds descending off the mountains can gust to 100 mph or more damaging roofs and other structures.

Extreme Cold

Extreme cold often accompanies a winter storm or is left in its wake. Prolonged exposure to the cold can cause frostbite or hypothermia and become life-threatening. Infants and elderly people are most susceptible. What constitutes extreme cold and its effect varies across different areas of the United States. In areas unaccustomed to winter weather, near freezing temperatures are considered "extreme cold." Freezing temperatures can cause severe damage to citrus fruit crops and other vegetation. Pipes may freeze and burst in homes that are poorly insulated or without heat. In the north, below zero temperatures may be considered as "extreme cold." Long cold spells can cause rivers to freeze, disrupting shipping. Ice jams may form and lead to flooding.

Ice Storms

Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days while utility companies work to repair the extensive damage. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians.

Heavy Snow Storms

Heavy snow can immobilize a region and paralyze a city, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can collapse buildings and knock down trees and power lines. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. In the mountains, heavy snow can lead to avalanches. The cost of snow removal, repairing damages, and loss of business can have large economic impacts on cities and towns.

In the Midwest and Plains... Storms tend to develop over southeast Colorado in the lee of the Rockies. These storms move east or northeast and use both the southward plunge of cold air from Canada and the northward flow of moisture from the Gulf of Mexico to produce heavy snow and sometimes blizzard conditions. Other storms affecting the Midwest and Plains intensify in the lee of the Canadian Rockies and move southeast. Arctic air is drawn from the north and moves south across the Plains and Great Lakes. Wind and cold sometimes combine to cause wind chill temperatures as low as 70F below zero. The wind crosses the lakes, tapping its moisture and forming snow squalls and narrow heavy snow bands. This is called "lake-effect snow."

Winter Storm Facts:

What Makes a Winter Storm?

COLD AIR:

below freezing temperatures in the clouds and near the ground are necessary to make snow and/or ice.

MOISTURE:

to form clouds and precipitation. Air blowing across a body of water, such as a large lake or the ocean, is an excellent source of moisture.

LIFT:

something to raise the moist air to form the clouds and cause precipitation. An example of lift is warm air colliding with cold air and being forced to rise over the cold dome. The boundary between the warm and cold air masses is called a front. Another example of lift is air flowing up a mountain side.

WINTER STORMS ARE CONSIDERED *DECEPTIVE KILLERS* BECAUSE MOST DEATHS ARE

INDIRECTLY

RELATED TO THE STORM

People die in traffic accidents on icy roads.

People die of hypothermia from prolonged exposure to cold.

Winter Deaths

Everyone is potentially at risk during winter storms. The actual threat to you depends on your specific situation. Recent observations indicate the following:

- Related to ice and snow:
- About 70% occur in automobiles.
- About 25% are people caught out in the storm.
- Related to exposure to cold:
- 50% are people over 60 years old.
- Over 75% are males.
- About 20% occur in the home.

COLD

FROSTBITE

Frostbite is damage to body tissue caused by that tissue being frozen. Frostbite causes a loss of feeling and a white or pale appearance in extremities, such as fingers, toes, ear lobes, or the tip of the nose. If symptoms are detected, get medical help immediately! If you must wait for help, slowly rewarm affected areas. However, if the person is also showing signs of hypothermia, warm the body core before the extremities.

HYPOTHERMIA: LOW BODY TEMPERATURE

Warning signs - uncontrollable shivering, memory loss, disorientation, incoherence, slurred speech, drowsiness, and apparent exhaustion.

Detection - Take the person's temperature. If below 95F (35C), immediately seek medical care! If medical care is not available, begin warming the person slowly. Warm the body core first. If needed, use your own body heat to help. Get the person into dry clothing, and wrap them in a warm blanket

covering the head and neck. Do not give the person alcohol, drugs, coffee, or any hot beverage or food; warm broth is better. Do not warm extremities (arms and legs) first! This drives the cold blood toward the heart and can lead to heart failure.

WIND CHILL

The wind chill is based on the rate of heat loss from exposed skin caused by combined effects of wind and cold. As the wind increases, heat is carried away from the body at an accelerated rate, driving down the body temperature. Animals are also affected by wind chill.

When CAUGHT in a Winter Storm...

OUTSIDE

Find shelter:

- try to stay dry cover all exposed parts of the body.
No shelter:
 - prepare a lean-to, wind-break, or snow cave for protection from the wind.
 - build a fire for heat and to attract attention.
place rocks around the fire to absorb and reflect heat.
Do not eat snow: It will lower your body temperature.
Melt it first.

IN A CAR OR TRUCK

Stay in your car or truck. Disorientation occurs quickly in wind-driven snow and cold.

Run the motor about ten minutes each hour for heat:
open the window a little for fresh air to avoid carbon monoxide poisoning.

make sure the exhaust pipe is not blocked.

Make yourself visible to rescuers:

- turn on the dome light at night when running engine.
tie a colored cloth (preferably red) to your antenna or door.
raise the hood indicating trouble after snow stops
Falling.
Exercise from time to time by vigorously moving arms, legs, fingers, and toes to keep blood circulating and to keep warm.

AT HOME OR IN A BUILDING

Stay inside. When using ALTERNATIVE HEAT from a fireplace, wood stove, space heater, etc.:

- use fire safeguards.
properly ventilate.
No heat:
 - close off unneeded rooms.
 - stuff towels or rags in cracks under doors.

cover windows at night.

Eat and drink. Food provides the body with energy for producing its own heat. Keep the body replenished with fluids to prevent dehydration.

Wear layers of loose-fitting, lightweight, warm clothing. Remove layers to avoid overheating, perspiration, and subsequent chill.

The Experimenters Bench

KEEP AHEAD OF THE STORM by listening to NOAA Weather Radio, commercial radio, and television for the latest winter storm watches, warnings, and advisories.

What to Listen For...

WINTER STORM WATCH:

Severe winter conditions, such as heavy snow and/or ice, are possible within the next day or two. Prepare now!

WINTER STORM WARNING:

Severe winter conditions have begun or are about to begin in your area. Stay indoors!

BLIZZARD WARNING:

Snow and strong winds will combine to produce a blinding snow (near zero visibility), deep drifts, and life-threatening wind chill. Seek refuge immediately!

WINTER WEATHER ADVISORY:

Winter weather conditions are expected to cause significant inconveniences and may be hazardous. If caution is exercised, these situations should not become life-threatening. The greatest hazard is often to motorists.

FROST/FREEZE WARNING:

Below freezing temperatures are expected and may cause significant damage to plants, crops, or fruit trees. In areas unaccustomed to freezing temperatures, people who have homes without heat need to take added precautions.

BE PREPARED... Before the Storm Strikes

At home and at work...

Primary concerns are the potential loss of heat, power, telephone service, and a shortage of supplies if storm conditions continue for more than a day.

Have available:

- Flashlight and extra batteries.
- Battery-powered NOAA Weather Radio and portable radio to receive emergency information. These may be your only links to the outside.
- Extra food and water. High energy food, such as dried fruit or candy, and food requiring no cooking or refrigeration is best.
- Extra medicine and baby items.
- First-aid supplies.
- Heating fuel. Fuel carriers may not reach you for days after a severe winter storm.
- Emergency heating source, such as a fireplace, wood stove, space heater, etc.
- Learn to use properly to prevent a fire.
- Have proper ventilation.
- Fire extinguisher and smoke detector. Test units regularly to ensure they are working properly.

In cars and trucks...

Plan your travel and check the latest weather reports to avoid the storm!

- Fully check and winterize your vehicle before the winter season begins.
- Carry a WINTER STORM SURVIVAL KIT:
 - blankets/sleeping bags;
 - flashlight with extra batteries;
 - first-aid kit;
 - knife;
 - high-calorie, non-perishable food;
 - extra clothing to keep dry;
 - a large empty can and plastic cover with tissues and paper towels for sanitary purposes;
 - a smaller can and water-proof matches to melt snow for drinking water;
 - sack of sand (or cat litter);
 - shovel;
 - windshield scraper and brush;
 - tool kit;
 - tow rope;
 - booster cables;
 - water container;
 - compass and road maps.
- Keep your gas tank near full to avoid ice in the tank and fuel lines.
- Try not to travel alone.

Let someone know your timetable and primary and alternate routes.

On the farm...

- Move animals to sheltered areas. Shelter belts, properly laid out and oriented, are better protection for cattle than confining shelters, such as sheds.

Have a water supply available. Most animal deaths in winter storms are from dehydration.

DRESS TO FIT THE SEASON. Wear loose-fitting, light-weight, warm clothing in several layers. Trapped air insulates. Layers can be removed to avoid perspiration and subsequent chill. Outer garments should be tightly woven, water repellent, and hooded. Wear a hat. Half your body heat loss can be from the head. Cover your mouth to protect your lungs from extreme cold. Mittens, snug at the wrist, are better than gloves. Try to stay dry.

Winter Weather Awareness

Chatter, Volume 21, Issue 12, Page 7

FAMILY DISASTER PLAN

Families should be prepared for all hazards that affect their area and themselves. NOAA's National Weather Service, the Federal Emergency Management Agency, and the American Red Cross urge each family to develop a family disaster plan. Where will your family be when disaster strikes? They could be anywhere at work, at school, or in the car. How will you find each other? Will you know if your children are safe? Disasters may force you to evacuate your neighborhood or confine you to your home. What would you do if basic services - water, gas, electricity or telephones - were cut off?

Follow these basic steps to develop a family disaster plan...

I. Gather information about hazards. Contact your local National Weather Service office, emergency management office or civil defense office, and American Red Cross chapter. Find out what type of disasters could occur and how you should respond. Learn your community's warning signals and evacuation plans.

II. Meet with your family to create a plan. Discuss the information you have gathered. Pick two places to meet: a spot right outside your home for an emergency, such as fire, and a place away from your neighborhood in case you can't return home. Choose an out-of-state friend as your "family check-in contact" for everyone to call if the family gets separated. Discuss what you would do if advised to evacuate.

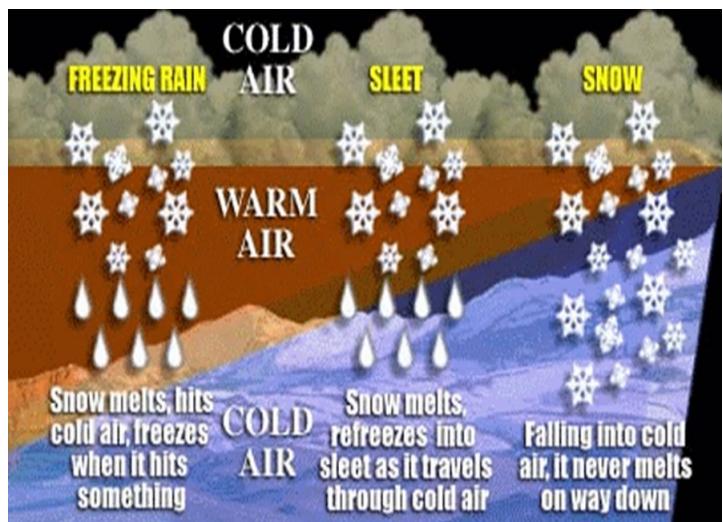
III. Implement your plan.

- Keep most emergency telephone numbers by phones;
- Install safety features in your house, such as smoke detectors and fire extinguishers;
- Inspect your home for potential hazards (such as items that can move, fall, break, or catch fire) and correct them;
- Have your family learn basic safety measures, such as CPR and first aid; how to use a fire extinguisher; and how and when to turn off water, gas, and electricity in your home;
-

Teach children how and when to call 911 or your local Emergency Medical Services number; (6) Keep enough supplies in your home to meet your needs for at least three days. Assemble a disaster supplies kit with items you may need in case of an evacuation. Store these supplies in sturdy, easy-to-carry containers, such as backpacks or duffle bags. Keep important family documents in a waterproof container. Keep a smaller disaster supplies kit in the trunk of your car.

A DISASTER SUPPLIES KIT SHOULD INCLUDE: A 3-day supply of water (one gallon per person per day) and food that won't spoil one change of clothing and footwear per person one blanket or sleeping bag per person a first-aid kit, including prescription medicines emergency tools, including a battery-powered NOAA Weather Radio and a portable radio, flashlight, and plenty of extra batteries an extra set of car keys and cash special items for infant, elderly, or disabled family member.

IV. Practice and maintain your plan. Ask questions to make sure your family remembers meeting places, phone numbers, and safety rules. Conduct drills. Test your smoke detectors monthly and change the batteries at least once a year. Test and recharge your fire extinguisher(s) according to manufacturer's instructions. Replace stored water and food every six months.



A Soldier's Christmas

By [Michael Marks](#)

The embers glowed softly, and in their dim light,
I gazed round the room and I cherished the sight;
My wife was asleep, her head on my chest,
My daughter beside me, angelic in rest.
Outside the snow fell, a blanket of white,
Transforming the yard to a winter delight;
The sparkling lights in the tree, I believe,
Completed the magic that was Christmas Eve.
My eyelids were heavy, my breathing was deep,
Secure and surrounded by love I would sleep
In perfect contentment or so it would seem,
So I slumbered, perhaps I started to dream.

The sound wasn't loud, and it wasn't too near,
But I opened my eye when it tickled my ear;
Perhaps just a cough, I didn't quite know,
Then the sure sound of footsteps outside in the snow.
My soul gave a tremble, I struggled to hear,
And I crept to the door just to see who was near;
Standing out in the cold and the dark of the night,
A lone figure stood, his face weary and tight.

A soldier, I puzzled, some twenty years old,
Perhaps a Marine, huddled here in the cold;
Alone in the dark, he looked up and smiled,
Standing watch over me, and my wife and my child.
"What are you doing?" I asked without fear,
"Come in this moment, it's freezing out here!
Put down your pack, brush the snow from your sleeve,
You should be at home on a cold Christmas Eve!"
For barely a moment I saw his eyes shift
Away from the cold and the snow blown in drifts
To the window that danced with a warm fire's light,
Then he sighed and he said "It's really all right,
I'm out here by choice. I'm here every night.
"It's my duty to stand at the front of the line
That separates you from the darkest of times;
No one had to ask or beg or implore me,

I'm proud to stand here like my fathers before me.
"My Gramps died at 'Pearl' on a day in December,"
Then he sighed, "That's a Christmas 'Gram' always remembers;

My dad stood his watch in the jungles of 'Nam,
And now it is my turn and so, here I am.
"I've not seen my own son in more than a while,
But my wife sends me pictures, he's sure got her smile;"

Then he bent and he carefully pulled from his bag,
The red white and blue ... an American flag.
"I can live through the cold and the being alone
Away from my family, my house and my home;
I can stand at my post through the rain and the sleet,
I can sleep in a foxhole with little to eat.
"I can carry the weight of killing another
Then his eye welled a tear that held no regret,

Or lay down my life with my sisters and brothers
Who stand at the front against any and all,
To insure for all time that this flag will not fall.
"So go back inside," he said, "harbor no fright,
Your family is waiting and I'll be all right."
"But isn't there something I can do, at the least
Give you money," I asked, "or prepare you a feast?
It seems all too little for all that you've done,
For being away from your wife and your son."

"Just tell us you love us, and never forget
To fight for our rights back at home while we're gone,
To stand your own watch, no matter how long.
"For when we come home, either standing or dead,
To know you remember we fought and we bled
Is payment enough, and with that we will trust
That we mattered to you as you mattered to us."

[Michael Marks](#)

December 7th, 2000

Christmas 1965: A Season of Sorrow

December 17, 1993.

A long-ago Christmas revisited and resolved:
I was a crew chief on a USMC UH34D Sikorsky helicopter. It was December 16, 1965, somewhere near Quang Ngai, Vietnam. Earlier that day, for the first time, I had shot and killed another human being. He was the enemy. The M60 machine gun can instantly turn flesh and blood into a unrecognizable gob. Especially when it is a child.

Flying into a forward observation post, I had a rare pleasure of seeing a friend I first met at boot camp three years before. We hadn't seen each other since; but, in just a few minutes that the mission allowed us, we renewed our friendship. Prepared to take flight, I asked Dave if there was anything I could do for him. He asked me to bring him a Christmas tree. Hours later, the day's sorties completed, I took the time to paint a primitive Christmas tree onto two pieces of cardboard taken from C-ration boxes. The paint was Marine green, the decorations were primer yellow, all drawn with a brush made from a piece of writing paper. On top was the Marine Corps eagle.

The early morning mission to again supply that outpost gave me the opportunity to present Dave with his Christmas tree. He, his crew, and I laughed about it, being so crude a decoration; but Dave liked it. I waved and smiled as my chopper took off for other duties.

By chance the next day, December 18, 1965, an unexpected radio call directed my helicopter to Dave's outpost. There had been a firefight very early that morning, and we were requested to carry a KIA out. As we neared the outpost, all the men were standing outside the sandbag bunker - all but Dave. I could barely make out their faces through the dust that the rotor wash kicked up as we touched down. Once settled on the ground, two Marines brought out the litter. The dead Marine was covered with a cardboard Christmas tree. I denied to myself that it was Dave. In just a few moments, the KIA was loaded on board; and we took off for the hospital and graves registration.

My eyes now wet, I forced myself to untie the straps which held the muddy, blood-soaked cardboard in place. Dave had taken automatic weapons fire full in his chest and probably died instantly. Since there were no body bags available, the men covered him with his Christmas tree.

Sometimes the mind can block out terrible memories; sometimes those memories come back to haunt. Since the early '80s, my family has not enjoyed a Christmas tree. I did not permit it, as I had not learned to accept those things which I could not change. Today, through the efforts of my family, Ray Blandford at the Vets Center in Dayton, and my own battle to resolve those memories which have long dominated my life, I have begun to understand what I must and how to deal with it in my everyday living so that I am in command.

It is not easy, but there is hope. I have discovered that many people do not realize what Christmas is until they lose one. I no longer see cardboard Christmas trees when I see the real thing, except when I want to remember a Marine buddy who wanted his own Christmas tree. I try to remember Dave the way I saw him alive the last time - joyous with his cardboard Christmas tree.

There will be no Christmas tree at our house this year, but next year looks very promising. A joyous Christmas to all.

Ed Kozak
Sidney, Ohio



I am a GRUNT.
I am bound by an oath;
Taken of my own free will.
I am a willing servant of my
nations people.
I will protect, defend and fight
in their defense.
I will do what others will not;
I will go where others fear to
tread.
I will forego my own safety and
comfort;
I will knowingly put myself in
harms way.
I will bring down upon my
enemy,
The full weight of my nations
wrath and resolve.
And though I do know fear and
pain,
My commitment to mission will
transcend these mental
obstacles.
I will be my brother's keeper,
And he will be mine.
I will never surrender,
I will never quit,
I will continue to fight until
victory is achieved,
Or I draw my last breath...
I am a GRUNT.

-Doc



"Joy to the World"

Joy to the World!

The Snow & Ice have come
And Ice coats the barren ground
You scrape a place for parking
And fall and break your ribs,
while your dog stands barking
You also break your hip
There's dog poop under the snow
The wonders of winter in Milwaukee

**Next Regular Meeting**

The next meeting will be on **Thursday, January 30th** at 7:00PM. We meet in the Fellowship Hall of Redemption Lutheran Church, 4057 N Mayfair Road. Use the south entrance. Access the MRAC Yahoo group for important details about the February Meeting.

Meeting Schedule:

Hamfest: February 15th, 8 am General admission

February 27th at 7 pm

Please do not call the church for information!

Club Nets

Please check in to our nets on Friday evenings.

Our ten meter SSB net is at **8:00 p.m. at 28.490 MHz**

USB Our two meter FM net follows at **9:00 p.m.** on our repeater at **145.390 MHz** with a minus offset and a **PL of 127.3 Hz**.

Visit our website at: www.w9rh.org

Or phone (414)-459-9741

**Chatter Deadline**

The **DEADLINE** for items to be published in the **Chatter** is the **15th of each month**. If you have anything (announcements, stories, articles, photos, projects) for the 'Chatter', please get it to me before then.

You may contact me or Submit articles and materials by e-mail at: Kc9cmt@earthlink.net

or by Post to:

Michael B. Harris

807 Nicholson RD

South Milwaukee, WI 53172-1447

* Net Control Operator needed. Contact Net Manager for information.

VE Testing:

January 4th, 2014 at Waukesha Bowling Lanes.

January 25, 2014

Location: Amateur Electronic Supply Time: 9:30 AM
(Walk-ins allowed)

ALL regular testing takes place at: Amateur Electronic Supply 5720 W. Good Hope Rd. Milwaukee, WI 53223

Area Swapfests

Jan. 4th, 2014 WARAC's 42nd Annual Midwinter Swapfest Location: Waukesha, WI Sponsor: West Allis Radio Amateur Club Website: <http://www.warac.org>

January 19th, 2014 47th Annual Mid-Winter Hamfest

Location: St. Charles, IL
Sponsor: Wheaton Community Radio Amateurs
Website: <http://wheatonhamfest.org>

MRAC Working Committees

100th Anniversary:

- Dave—KA9WXN
- Dan—N9ASA

Net Committee:

- Open

Field Day

Dave—KA9WXN, Al—KC9IJJ

FM Simplex Contest

- Joe – N9UX
- Jeff – K9VS

Ticket drum and drawing

- Tom – N9UFJ

Newsletter Editor

- Michael-KC9CMT

Webmaster

- Mark Tellier—AB9CD

Refreshments

- Hal—KB9OZN



Membership Information

The Hamateur Chatter is the newsletter of MRAC (Milwaukee Radio Amateurs' Club), a not for profit organization for the advancement of amateur radio and the maintenance of fraternalism and a high standard of conduct. MRAC Membership dues are \$17.00 per year and run on a calendar year starting January 1st. MRAC general membership meetings are normally held at 7:00PM the last Thursday of the month except for November when Thanksgiving falls on the last Thursday when the meeting moves forward 1 week to the 3rd Thursday and December, when the Christmas dinner takes the place of a regular meeting. Club Contact Information

Our website address <http://www.w9rh.org>

Telephone **(414)-459-9741**

Address correspondence to:

MRAC, PO Box 26233, Milwaukee, WI 53226-0233

Email may be sent to: w9rh@arrl.net. Our YAHOO newsgroup:

<http://groups.yahoo.com/group/MRAC-W9RH/>

CLUB NETS:

- The Six Meter SSB net is Thursday at 8:00PM on 50.160 MHz USB
- Our Ten Meter SSB net is Friday at 8:00PM on 28.490 MHz ± 5 KHz USB.
- Our Two Meter FM net follows the Ten meter net at 9:00PM on our repeater at 145.390MHz - offset (PL 127.3)



The MRAC HamChatter is a monthly publication of the Milwaukee Radio Amateurs' Club. Serving Amateur Radio in Southeastern Wisconsin & all of Milwaukee County

Club Call sign – W9RH

MRAC Website: <http://www.W9RH.org>

Editor: Michael B. Harris, Kc9cmt, kc9cmt@Earthlink.net

Milwaukee Area Nets

- | | |
|---|--|
| Mon. 8:00 PM 3.994 Tech Net | Wed. 8:00 PM 147.270+ Racine County ARES net |
| Mon. 8:00 PM 146.865- ARRL Newsline | Wed. 9:00 PM 145.130+MAARS SwapNet, link to FM-38 |
| Mon. 8:00 PM 146.445+ Emergency Net | Thur. 8:00 PM 50.160, 6 Mtr SSB Net |
| Mon. 8:00 PM 146.865- Walworth County ARES net | Thur. 9:00 PM 146.910+ Computer Net |
| Mon. 8:45 PM 147.165- ARRL Audio News | Fri. 8:00 PM 28.490 MRAC W9RH 10 Mtr SSB Net |
| Mon. 8:00 PM 442.100+ Railroad net, also on EchoLink | Fri. 9:00 PM 145.390+ W9RH 2 MTR. FM Net |
| Mon. 8:30 PM 442.975+ WARC W9CQ net also on EchoLink 576754 | Sat. 8:00 PM 146.910+ YL's Pink HAMsters Net |
| Mon. 8:30 PM 442.150+ Waukesha ARES Net on the 1st, 3rd, and 5th Monday of each month. | |
| Mon. 9:00 PM 147.165- Milwaukee County ARES Net | Sat. 9:00 PM 146.910+ Saturday Night Fun Net |
| Tue. 9:00 AM 50.160 6. Mtr 2nd Shifter's Net | Sun 8:30 AM 3.985 QCWA (Chapter 55) SSB net |
| Tue. 9:00 PM 145.130+ MAARS Hand Shakers Net | Sun 9:00 AM 145.565+ X-Country Simplex Group |
| Tue. 8:00 PM 7.035 A.F.A.R. (CW) | Sun 8:00 PM 146.910+ Information Net |
| Wed. 8:00 PM 145.130+MAARS Amateur Radio Newsline | Sun 8:00 PM 28.365 10/10 International Net (SSB) |
| Wed. 8:00 PM 147.045+ West Allis ARC net | Sun 9:00 PM 146.910+ Swap Net |

Thursday's 8:00 PM 448.300+ Tech Net

2meter repeaters are offset by 600KHz -- 70 centimeter repeaters are offset by 5 MHz

